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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/564,705	06/02/2006	Alex Philip Vogel	U 016104-2	1684

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LADAS & PARRY LLP
26 WEST 61ST STREET
NEW YORK, NY 10023

EXAMINER	
PARSA, JAFAR F	

ART UNIT	PAPER NUMBER
1621	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/564,705	VOGEL, ALEX PHILIP	
	Examiner	Art Unit	
	Jafar Parsa	1621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *02 June 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *1/13/2006*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

Claim 3 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 3 recites the limitation "*hydrocarbon synthesis*" in lines 1-2. There is insufficient antecedent basis for this limitation in the claim.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Vogel et al (US 2002/0035163 A1) in view of Leviness et al (USPN 5,811,469).

Applicant's claimed invention is directed to a process for producing liquid and, optionally, gaseous products from gaseous reactants, which process includes feeding,

at a low level, gaseous reactants into a slurry bed of solid catalyst particles suspended in a suspension liquid; allowing the gaseous reactants to react as they pass upwardly through the slurry bed, thereby to form liquid and, optionally, gaseous products, with the reaction being catalyzed by the catalyst particles and with a product mixture comprising liquid product and catalyst particles having a range of sizes, being formed; subjecting, in a primary filtration stage, the product mixture to primary filtration by passing the liquid product through a filtering medium having a plurality of filtering openings through which the liquid product passes, with the liquid product passing through the filtering openings in a first direction and with the filtering openings having a controlling dimension of x microns, so that large catalyst particles having a particle size greater than x microns are separated from the liquid product, thereby to obtain a primary filtrate comprising liquid product, near-size catalyst particles that range in size from 1 micron to x microns, and fine catalyst particles that are smaller than 1 micron; subjecting, in a secondary filtration stage, the primary filtrate to secondary filtration to separate the near-size catalyst particles and, optionally, some of the fine catalyst particles, from liquid product, thereby to obtain a secondary filtrate comprising liquid product and fine catalyst particles; allowing a cake of catalyst particles to build up on the filtering medium in the primary filtration stage; from time to time interrupting the passage of liquid product through the filtering medium in the primary filtration stage; and backflushing the filtering medium by passing secondary filtrate, as a flushing liquid, through the filtering medium in a second direction, opposite to the first direction, for at least portions of the periods that the liquid product passage is interrupted, thereby to dislodge the cake from the filtering medium.

Vogel teaches a process producing liquid and, optionally, gaseous products from gaseous reactants feeds, at a low level, gaseous reactants into a slurry bed of solid catalyst particles suspended in a suspension liquid. The gaseous reactants are allowed to react as they pass upwardly through the slurry bed, hereby to form liquid and, optionally, gaseous products. The reaction is catalyzed by the catalyst particles. Liquid product is separated from the catalyst particles by passing, in a filtration zone within the slurry bed, liquid product through a filtering medium having a plurality of openings through which the liquid passes. The openings have a controlling dimension of x microns. The proportion of catalyst particles, which have a particle size smaller than x microns, in the slurry bed is less than 18% by volume based on the total volume of the catalyst in the slurry bed. The dimension of x may typically be 40 microns. See abstract and paragraph 009.

Vogel teaches that the maximum allowable controlling dimension of the filtering medium will thus be dictated by the portion of catalyst particle sizes smaller than the controlling dimension of the filter, present in the slurry bed. Although, in slurry phase reactions, catalyst breakup due to attrition normally takes place, resulting in a lowering of the minimum particle size, and a decrease in the average catalyst particle size, it has surprisingly been found that catalyst breakup by attrition or any other means of disintegration can be almost entirely avoided. See paragraph 0016.

Vogel teaches that the process may thus include allowing a cake of catalyst particles to form on the filtration medium; from time to time interrupting the passage of liquid product through the filtering medium; and backflushing the filtering medium in the

opposite direction to the direction of flow through the filtering medium during the separation of the liquid product from the catalyst particles, thereby to dislodge the cake from the filtering medium. The backflushing may be effected for at least portions of the periods that the liquid product passage through the filtering medium is interrupted. See paragraphs 0026 and 0031. The catalyst particles can, at least in principle, be any desired supported Fischer-Tropsch catalyst, such as an iron-based catalyst, a cobalt-based catalyst, or any other Fischer-Tropsch catalyst. Supported catalysts, which are physically stronger than unsupported catalysts. See paragraph 0017.

Vogel teaches that the pressure differential across the filtering media and filter cake during backflushing may be up to 10 bar depending on the degree of clogging or age of the filtering media, and is typically at least 1 bar higher than the filtration pressure differential. The flushing fluid flow rate may be at least 6000 $l/h/m^2$ of filtering media. Thus, the flushing fluid flow rate may be between 6000 $l/h/m^2$ of filtering media when the pressure differential across the filtering media is about 5 bar, and between about 10000 and 12000 $l/h/m^2$ when the pressure differential is about 10 bar. The process may preferably include subjecting the filtering elements to a waiting period during which no filtering or backflushing takes place, ie during which there is no liquid flow through the filtering media of the elements, to enhance subsequent filtration. The waiting period may be up to 60 minutes, or even longer, but is typically less than 30 minutes. See paragraphs 0032-0034.

The difference between Vogel and the claimed invention is that the instant claims required passing the primary filtrate to secondary filtration to separate the near –size

catalyst particles and optionally, some of the fine catalyst particles, from liquid product, thereby to obtain a secondary filtrate comprising liquid product and fine catalyst particles.

However, Leviness teaches a hydrocarbon synthesis reactor having both an internal and external filter fed by respective gas disengaging downcomers for removing liquid hydrocarbon products. See col. 4, lines 35-40. The slurry typically contains from about 10 wt. % to 70 wt, in some embodiments 40 wt. % to 55 wt. % catalyst solid. As mentioned above, the slurry liquid comprises the hydrocarbon products which are liquid at the reaction conditions, along with minor amounts of other components. While catalyst particle sizes may broadly range from as small as 1 to as large as 200 microns a typical conventional Fe or supported iron catalyst will have a mean particle size of about 22 microns while a catalyst comprising a catalytic metal such as cobalt composited with or supported on titania will typically have a mean particle size of about 63 microns. However, such catalysts will also include fine particles as small as 1 micron and the constant agitation and mixing of the catalyst particles in the slurry results in particle size reduction through attrition. As a consequence of the removal of catalyst enriched slurry from the outer zone into the outer zone downcomers, a gas and catalyst particle or solids reduced slurry also formed. See col. 5, lines 16-28. It would therefore have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the hydrocarbon synthesis reactor of Vogel with a secondary filtration zone, in order to reduce the build up of the solids in the first filtration zone and reducing the catalyst fines in the liquid products.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jafar Parsa whose telephone number is (571)272-0643. The examiner can normally be reached on 9 a.m.-5:30 p.m. (M-F).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bonnie Eyler can be reached on 571-272-0871. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jafar Parsa/
Primary Examiner, Art Unit 1621
April 26, 2008